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$$= \frac{ab\sqrt{2}}{\sqrt{[A+B+(A-B)\cos 2\theta + 2B\sin 2\theta]}} = \frac{ab\sqrt{2}}{D}.$$

$$dr = \frac{ab\sqrt{2}[(A-B)\sin 2\theta - 2C\cos 2\theta]d\theta}{D^3} = \frac{ab\sqrt{2}Ed\theta}{D^3}.$$

$$ds = \frac{2ab\sqrt{2}[A^2 + B^2 + 2C^2 + (A^2 - B^2)\cos 2\theta + 2C(A+B)\sin 2\theta]}{D^2}d\theta$$

$$= \frac{2abFd\theta}{D^3}, \quad dy = dr\sin\theta + r\cos\theta d\theta.$$

Now $X = -g$, $Y = 0$. $\therefore R = v^2/\rho + g(dy/ds)$.

$$\frac{dy}{ds} = \frac{E\sin\theta + D^2\cos\theta}{F\sqrt{2}}. \quad \therefore R = \frac{v^2}{\rho} + \frac{g(E\sin\theta + D^2\cos\theta)}{F\sqrt{2}}.$$

$$\text{When } R=0 \text{ and } \theta=\pi, v^2 = \frac{Ag\rho}{\sqrt{(A^2 + C^2)}} = \frac{g(Aa^2 + Ab^2 - a^2b^2)^{\frac{3}{2}}}{ab\sqrt{(A^3 + AC^2)}}.$$

If $\beta=0$, $v^2 = b^2g/a$; if $a=b$, $v^2 = ag$.

— DIOPHANTINE ANALYSIS. —

92. Proposed by M. A. GRUBER, A. M., War Department, Washington, D. C.

Find the sides of integral right triangles when the difference of the legs is given.

No solution of this problem has been received.

93. Proposed by the late SYLVESTER ROBBINS.

Solve and set forth twenty terms in some infinite series of rational parallelipeds following the solid whose edges are 2, 3, 6, and diagonal 7.

Solution by G. B. M. ZERR, A.M., Ph.D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

Let x , $x+1$, x^2+x be the edges. Then $x^2 + (x+1)^2 + (x^2+x)^2 = (x^2+x+1)^2$. $\therefore$ The diagonal $= x^2+x+1$.

No.	x	$x+1$	x^2+x	x^2+x+1
1	2	3	6	7
2	3	4	12	13
3	4	5	20	21
4	5	6	30	31
5	6	7	42	43
6	7	8	56	57
7	8	9	72	73